

PEARL FROM A FRESHWATER MUSSEL, AND NOTES
ON THE OCCURRENCE OF PEARLS

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(Contribution from the Australian Museum, Sydney)

When Mrs. M. E. Freame was washing the animal from a freshwater mussel, taken from a lagoon off the Murray River at Everton, she was surprised to find a small pearl, unattached, and partly imbedded in the fleshy part of the animal. Together with the shell, Mrs. Freame kindly forwarded the pearl to me, at the Australian Museum, as she wished to know whether this was a common occurrence.

The mussel was a species common to Victoria, *Uclesunia danelli*, a rather thin, swollen bivalve, heavily eroded towards its umbo, as is usual in many of the Australian freshwater mussels. The small pearl was pear-shaped, measured seven millimetres in length by six millimeters at its broadest part, and simply reproduced the "pearliness" of the shell in which it was found, a beautiful iridescent silver, tinged with pinkish purple. Round the smooth pearl at intervals, were slight encircling depressions. A leading Sydney jeweller, who expressed the opinion that it was one of the best pearls he had seen from an Australian freshwater mussel, showed me many



Pearl from Freshwater
Mussel x 5½.

specimens of different pearls with these furrows, and said that it was a common structure in them, particularly in those originating in shells other than true pearl-shells. In many pearls shown me the depressions were more pronounced even than in this one from Victoria. It is possible, sometimes, if the depression is very slight and the pearl is otherwise a valuable one, by peeling off the outer coat to find that the inner part has escaped this fault; but, as a general rule, little can be done to pearls possessing this depression; they serve mostly as curios, or if used, it is for studs and similar articles requiring only part of a pearl.

It is believed by some people that pearls occur only in true pearl-shells. This is quite erroneous, as they can be found in any number of different kinds of shells, the type of pearl depending on the pearliness of the shell in which it is formed. Most shells consist of a number of layers, the inner of which forms the internal surface of the shell, and it is the condition of this which determines the nature of the pearl found within a shell. Apart

from the nucleus of a pearl, the structure, in the majority of cases, is similar to that of the nacre of its shell: the origin counts for very little, the quality depending on the surroundings in which the pearls develop. For that reason the pearl-shells of the world, in which the internal surface is a smooth, opalescent substance called mother-of-pearl, produce the finest pearls known. The mother-of-pearl nacre is really an accumulation of extremely thin and delicate laminae or platelets overlapping one another, and lying parallel to the surface of the shell. The edges of the laminae are zigzag, and the surface formed by these and the other parts of the face of the laminae affect light in such a manner that an iridescent lustre is produced.

It is strange that a beautiful jewel, so much in demand for ornamentation from the earliest times till the present day, should be formed by some irregularity in the tissues of certain shell-bearing molluscs. When foreign bodies enter the shell, such as grains of sand, animal parasites, or other objects, the mollusc coats any that comes in contact with parts of its soft body with the same nacre as that which forms the internal surface of the shell. It is in this way that pearls are formed, either naturally or artificially, attached to the shell or in the tissues and organs of the mollusc itself, but unless a shell possesses a nacre with a perfect lustre, sufficient to produce a similarly lustrous pearl, the jewel formed, cannot, however perfect in shape or brilliant in colour, be classed as a perfect gem pearl.

Pearls are found in common oysters, conch shells, abalones, freshwater and marine mussels, sea-wings and window-pane shells, and hosts of other kinds, besides, of course, the main pearl-bearing shells of the world, those of the family Pinctadidae. In all these, moreover, they assume an almost infinite variety of shapes, due largely to the shape of the central nucleus (which is really the foreign body causing the formation of the pearl), and the position of it in the mollusc. The most usual, and, incidentally, the most valuable kind, is that of spherical shape, which occurs only in the soft parts of the animal, but slight departures from this shape may still result in a valuable pearl.

In the majority of molluscs, except the true mother-of-pearl shells, but including some of the previously mentioned ones, the more or less total absence of the overlapping nacreous laminae means a corresponding lack of lustre. It is this fact which makes the pearls from many of these shells of less value than those with the characteristic lustre and subdued iridescent beauty of a true pearl, and makes them in the majority of cases more articles of local curiosity or interest, than of commercial value.

The common oyster usually produces a dull or opal white, purple, or even variegated pearl, sometimes several dozen small

ones being found in the same shell; the clam has rather large opal white ones, with little lustre and of little value, and those of venus shells, though of good form, lack the iridescence of true pearls. From window-pane shells, great numbers of small, dull, lead-coloured seed-pearls are collected and exported chiefly to China, from the Ceylon fisheries and the Philippines. These are of little



Freshwater Mussel from Victoria, and the Pearl which was found imbedded in it.

value and are mainly used in medicants. Sea-wings, sometimes called the "silkworms of the sea," because the animal builds a byssus of fine silken threads for attaching itself to a fixed abode, are found in the Red Sea, Mediterranean, Indian Ocean, and Pacific Ocean, and in the different species are sometimes found pearls of a silvery, reddish, or orange hue; in the New Caledonian forms they have sometimes been almost black. The marine mussels of the European coasts yield pearls with a slight lustre, and the Indian chank shell, used for making bracelets and for other purposes, occasionally contains pink or pale red ones. The pearly nautilus, which has a particularly nacreous shell, produces yellowish pearls. One of the most beautiful pearls ever found in a mollusc other than a true pearl-bearing species, was disclosed in a specimen of the Giant Conch (*Strombus gigas*) of the West Indies and Florida. This shell, which grows to 12 inches in length, is collected in great numbers for food, and in preparing the animal several pink pearls of considerable value have been found, apart

from the large number of inferior ones. The pearls of the abalone, or ear-shell, found in California, Japan, Australia, New Zealand, and in most tropical waters are especially interesting, because of the unusual and brilliant colouring, blue, yellow and a predominance of green.

The pearls most approaching those found in pearl-shells, and termed "orients," are probably those found in freshwater mussels, especially of America and Europe. In the latter place for many centuries they formed the main supply of pearls, as they did in Great Britain and China. In America, especially along the Mississippi and its tributaries, many beautiful pearls have been found and have realised a high price in the market. The mussels found there are of many different kinds, and though related distantly to those of Australian freshwater streams are much more solidly built and very nacreous. Our freshwater mussels, on the other hand, are thin, and, though they possess in most cases a nacreous internal surface, this does not approach that of the American ones. The latter shells are so solid, in fact, that for many years now they have been used for manufacturing pearl buttons of excellent quality. Ours could not be used for that purpose.

The instance of Mrs. Freame's finding a pearl in an Australian freshwater mussel is the first record I have, though I have known of specimens being found in oysters here; but doubtless concentrated search in the animals of any number of shells would result in the discovery of some pearly formations. In a large percentage of American freshwater mussels, the pearls found are "hinge" ones, that is, elongated formations near the hinge part of the shell. These are due, not to parasites, but to excess of carbonate of lime in the water, and the pearls formed are simply storages of surplus nacre, and are of different shapes.

The colour of pearls has no connection with the lustre of the shell, but is generally the colour of the shell in which it is found, black-coloured shells producing blackish pearls, and similarly those of a pinkish hue have pink pearls. Colour alone, however, is not sufficient, but when it is combined with a peculiar lustre and tint, a valuable pearl results. White, or as nearly white as possible is most desired, and on the average the Ceylon pearls reach the ideas of perfection. Comparing most favourably with them, however, are the Australian ones, generally pure white and lustrous, with a silvery sheen. For people who prefer a more golden tinge in their pearls, there are those from China, India, and the Persian Gulf, and sometimes Western Australia, which are smooth, saffron-like, golden jewels.

A valuable pearl may even yet be found in an Australian freshwater mussel.